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EXAMINER	
THAI, CUONG T	
ART UNIT	**PAPER NUMBER**
2173	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Appli ation No.	Applicant(s)	
	09/745,696	SMITH ET AL.	
	Examiner	Art Unit	
	CUONG T THAI	2173	

-- The MAILING DATE of this communication app ars on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/02/04 Amend.; Inter on 6/07/4 & 6/18/4*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37,40-42,44,46 and 49-58* is/are rejected.

7)☒ Claim(s) *38,39,43,45,47 and 48* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/12/04 & 7/02/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL ACTION

1. This action is responsive to Amendment filed on July/02/2004 and Interview summary on June/07/2004 and June/18/2004.

2. Claims 1-58 are presented for examination.

3. The Information Disclosure Statements (IDSs) filed on July/12/2004 July/02/2004 have been received and considered by the Examiner.

Drawings Objections

4. The drawings objection of Figs. 1-3 and 6 are hereby withdraw.

Claim Rejections - 35 USC § 102

5. The following is a quotation of 35 U.S.C. 102(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1-2, 8-13, 17-19, 25-37, 40-42, 44, 46 and 50 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicants submitted prior art issued to Miura et al. (USPN: 5,886,684) hereinafter Miura.

As per claims 1 (method) and 50 (readable medium), Miura discloses a computer-implemented method for positioning a movable item within a three-dimensional space observable under a microscope as the technique of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be

moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58), the method comprising:

Presenting a graphical representation of at least a portion of the three dimensional space is taught by Miura as the technique of the display means displays both of the picked up image and the height position of the tip portion of the fine instrument. As the result, the position relation about the tip portions of the micromanipulators can be three dimensionally grasped based upon the plain image produced by the image pick up operation (see col. 21, lines 5-11);

Receiving, within the graphical representation, a user indication of a location within the graphical representation is taught by Miura as the technique of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). And the Z limit setting key was turned ON by manipulating the joy sticks and the like at the step S112, the present position of the K-th micromanipulator along the Z axis direction at this time is set as the reference point and the stored into the memory (see col. 19, lines 22-26);

Positioning the movable item at a three-dimensional location corresponding to the location within the graphical representation is taught by Miura as the technique of the micromanipulators are provided independently in

three axial directions which are orthogonal to each other for moving the fine instrument three-dimensionally (see col. 5, lines 4-7).

These claim are therefore rejected for the reasons as set forth above.

As per claim 2, due to the similarity of this claim to the last two limitations of claim 1, this claim is therefore rejected for the same reasons applied to claim 1.

As per claim 8, the limitation of wherein the graphical representation is a captured image depicts a field of view of the microscope is taught by Miura as the technique of the display means displays both of the picked up image and the height position of the tip portion of the fine instrument. As the result, the position relation about the tip portions of the micromanipulators can be three dimensionally grasped based upon the plain image produced by the image pick up operation (see col. 21, lines 5-11) of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53). This claim is therefore rejected for the reason as set forth above.

As per claim 9, due to the similarity of this claim to that of claim 8, this claim is therefore rejected for the same reason applied to claim 8.

As per claim 10, the limitation of wherein the item is for delivery a pharmacological agent and after positioning the item at the three-dimensional location, delivery the pharmacological at the three-dimensional location is taught by Miura as the technique of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a **cell** is place-able on the manipulating stage 46 (see col. 8, lines 50-53) and the image picked up by the TV camera (see col. 15, line 21 and also see Fig. 8). This claim is therefore rejected for the reason as set forth above.

As per claim 11, the limitation of wherein positioning the item comprises directing the item with a micromanipulator via directives sent from the computer is taught by Miura as the technique of on the basis of that ratio of the amount of movement, the control signal for each axis direction is supplied to the micromanipulator (see col. 18, lines 17-19) and the control unit 26 includes a controller 40 which has a microprocessor, RAM, ROM, memory 43. Connected to the controller 40, are the TV camera 14, the manipulating panel 48, drivers 41 and 42 for driving the micromanipulators 4 and 5 in the three axial directions (see col. 9, lines 8-13). This claim is therefore rejected for the reason as set forth above.

As per claim 12, the limitation of wherein positioning the item further comprises sending the three-dimensional positioning information to a micromanipulator controller is taught by Miura as the technique of the control unit

26 control the microscope 3 to perform the focus adjustment and the movement driver of the manipulating stage (see col. 14 line 67 to col. 15 line 2). This claim is therefore rejected for the reason as set forth above.

As per claim 13, the limitation of wherein the graphical representation of the three-dimensional space represents a region beneath the surface of a biological specimen being viewed under microscope and positioning the item comprises directing the item beneath the surface of the biological specimen viewed under microscope is taught by Miura as the technique of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). This claim is therefore rejected for the reason as set forth above.

As per claim 17, the limitation of wherein receiving a user indication of a location within the graphical representation receiving an activation of a graphical pointer positioned at a location on a presented image is taught by Miura as the technique of Set Reference position (see Fig. 15) and settings may be determined and designated by using icons displayed on the monitor 27 and chosen using, for instance, the mouse in a manner consistent with a personal

computer (see col. 15, lines 8-12). This claim is therefore rejected for the reason as set forth above.

As per claim 18, the limitation of wherein presenting a graphical representation of the three-dimensional space comprises presenting a two-dimensional video representation of the three-dimensional space on a video display device is taught by Miura as the technique of Set Reference position (see Fig. 15) of picked up image (see col. 21, line 6), and settings may be determined and designated by using icons displayed on the monitor 27 and chosen using, for instance, the mouse in a manner consistent with a personal computer (see col. 15, lines 8-12). This claim is therefore rejected for the reason as set forth above.

As per claim 19, the limitation of wherein presenting a graphical image of the three-dimensional space comprises presenting an image generated from observation of a portion of the three-dimensional space under microscope is taught by Miura as the technique of the display means displays both of the picked up image (see col. 21, lines 5-6) when the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). This claim is therefore rejected for the reason as set forth above.

As per claim 25, the limitation of wherein a biological specimen is viewed under the microscope in the three-dimensional space and position the item comprising positioning the item with respect to the biological specimen under microscope is taught by Miura as the technique of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). This claim is therefore rejected for the reason as set forth above.

As per claims 26-29, the limitations of wherein the biological specimen is living (see claim 26), the biological specimen comprises brain tissue (see claim 27), the biological specimen comprises nerve tissue (see claim 28), and the biological specimen comprises muscle tissue (see claim 29), respectively, is taught by Miura in term of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as **a cell** is place-able on the manipulating stage 46 (see col. 8, lines 50-53). These claims are therefore rejected for the reason as set forth above.

As per claim 30, the limitation of wherein the item is an electrode for measuring electrical signal is taught by Miura as the technique of the

manipulating unit 8 is outputs a voltage signal (see col. 21, lines 55-56 and also see Fig. 20). This claim is therefore rejected for the reason as set forth above.

As per claim 31, the limitation of collecting information indicating a safe zone for an object, wherein a safe zone indicates a zone within which the item can be moved without damage to the object and wherein positioning the item comprises directing the item to a location within the safe zone before positioning the item at the three-dimensional location is taught by Miura as the technique of the manipulating stage 46 can be moved by a drive mechanism in a horizontal direction (X and Y axial directions) and **a vertical direction (Z axial direction**) (see col. 8, lines 55-58) wherein the Z-limit setting operation is OFF (see col. 19, lines 53-54) or the Z-limit setting operation is ON (see col. 19, line 57). As to the Z-direction position of the micromanipulator, since moving distance id grasped by the control section unit 26 based on the control signal supplied to the drive unit 29, the Z-direction position of the micromanipulator may be specified based upon this moving distance (see col. 19, lines 60-65). This claim is therefore rejected for the reason as set forth above.

As per claim 32, the limitation of the limitation of collecting information indicating a safe zone for an object under the microscope, wherein a safe zone indicates a zone within which the item can be moved without damage to the object and responsive to an indication by the user, directing the item to a location within the safe is taught by Miura as the technique of the manipulating stage 46

can be moved by a drive mechanism in a horizontal direction (X and Y axial directions) and **a vertical direction (Z axial direction**) (see col. 8, lines 55-58) wherein **the Z-limit setting operation is OFF** (see col. 19, lines 53-54) or **the Z-limit setting operation is ON** (see col. 19, line 57) (see Fig. 17). As to the Z-direction position of the micromanipulator, since moving distance id grasped by the control section unit 26 based on the control signal supplied to the drive unit 29, the Z-direction position of the micromanipulator may be specified based upon this moving distance (see col. 19, lines 60-65). This claim is therefore rejected for the reason as set forth above.

As per claims 33-34, the limitation of wherein the safe zone is defined as a zone that is specified distance above the stage of the microscope (see claim 33) and wherein the safe zone is defined as a zone that is specified distance above a surface of the object (see claim 34) is taught by Miura as the technique of the manipulating stage 46 can be moved by a drive mechanism in a horizontal direction (X and Y axial directions) and **a vertical direction (Z axial direction**) (see col. 8, lines 55-58) wherein **the Z-limit setting operation is OFF** (see col. 19, lines 53-54) or **the Z-limit setting operation is ON** (see col. 19, line 57) (see Fig. 17). **The Z-direction position of the micromanipulator may be specified based upon this moving distance** (see col. 19, lines 63-65). These claims are therefore rejected for the reason as set forth above.

As per claim 35, the limitations determining an implicit Z depth based on the Z depth related to the graphical representation of the portion of the three-dimensional space; wherein positioning the item at a three-dimensional location within the three-dimensional space comprises the following: converting the implicit Z depth and the indicated location within the graphical representation into information in a three-dimensional coordinate system specifying a physical location within the three-dimensional space and sending the information in the coordinate system specifying the physical location within the three-dimensional space to a manipulator operable to move the item to the physical location within the three-dimensional space are taught by Miura as the techniques of at a step S134, both of a bar representation and a numeral value representative of the distance are outputted as character information ..... fourth manipulator from the lower limit position "Z limit", "0" is displayed on a numeral value display section 40 and no bar representation is made (see col. 20, lines 12-51). This claim is therefore rejected for the reason as set forth above.

As per claim 36, the limitation of converting the physical location within the three-dimensional space into three-dimensional coordinate system specifying the motor position of a motorized manipulator is taught by Miura as the technique of in the display process defined at the step S104 (Fig. 15), the image picked up by the TV camera 14 is displayed. At this time, when the Z-position display is set, the character information indicative of the Z-direction position of the micromanipulator, which is outputted at the step S110, is synthesized with the

image obtained from the TV camera 14, and the synthesized image is displayed on monitor 27 (see col. 20, lines 27-33). This claim is therefore rejected for the reason as set forth above.

As per claim 37, the limitation of collecting information for the converting is taught by Miura as the technique of the display process defined at the step S104, the image is picked up by the TV camera 14 is displayed. At this time, when the Z-position display is set, the character information indicative of the Z-direction position of the micromanipulator, which is outputted at step S110, is synthesized with the image obtained from the TV camera (see col. 20,lines 27-33). This claim is therefore rejected for the reasons as set forth above.

As per claim 40, the limitation of generating a matrix for transforming a location within an image into a physical location within three-dimensional space is taught by Miura as the technique of the image is picked up by the TV camera 14 is displayed. At this time, when the Z-position display is set, the character information indicative of the Z-direction position of the micromanipulator, which is outputted at step S110, is synthesized with the image obtained from the TV camera (see col. 20,lines 28-33). This claim is therefore rejected for the reasons as set forth above.

As per claim 41, the limitation of wherein the matrix is homogeneous matrix is taught by Miura as the technique of a fine sample such as **a cell** is

place-able on the manipulating stage 46 (see col. 8, lines 52-53). These claims are therefore rejected for the reason as set forth above.

As per claim 42, the limitation of calibration comprise generating a matrix for transforming a physical location within a three-dimensional space into a motor position for a manipulator is taught by Miura as the technique of the image is picked up by the TV camera 14 is displayed. At this time, when the Z-position display is set, the character information indicative of the Z-direction position of the micromanipulator, which is outputted at step S110, is synthesized with the image obtained from the TV camera (see col. 20,lines 28-33) and a present position calculating device calculates a present position of the stepper motor in a virtual subdivision unit which is obtained by subdividing the reference subdivision unit to a pre-selected subdivision number (see abstract). This claim is therefore rejected for the reasons as set forth above.

As per claim 44, the limitation of wherein collecting information comprises: for a plurality of points, performing the following: under control of software, automatically directing the item to one of the points and receiving an indication of where on the image the item appears is taught by Miura as the technique of the stepping motor is independently provided on the micromanipulator so as to move the fine instrument in a plurality of axial directions. A moving ratio calculating device calculates a ratio of moving amounts along the axial directions based upon a moving angle of the fine instrument. The input device calculates either the

moving speed or the moving position along the respective axial directions based upon the ratio of moving amounts (see abstract). This claim is therefore rejected for the reasons as set forth above.

As per claim 46, the limitation of wherein collecting calibration information comprises incrementally collecting calibration information is taught by Miura as the technique of a present position calculating device calculates a present position of the stepper motor in a virtual subdivision unit which is obtained by subdividing the reference subdivision unit to a pre-selected subdivision number (see abstract). This claim is therefore rejected for the reasons as set forth above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3-7, 20-24, 49 and 57-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (USPN: 5,886,684) hereinafter Miura as applied to claims above in view of Applicants submitted prior art issued to Reinhardt et al. (USPN: 6,333,749) hereinafter Reinhardt.

As per claim 3, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitation of transforming the location on the graphical location to values indicating the three-dimensional location in the three-dimensional space.

Reinhardt discloses the limitation of transforming the location on the graphical location to values indicating the three-dimensional location in the three-dimensional space as the technique of manipulating primitives, which are used to construct three-dimensional models on a video display (see col. 4, lines 24-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt teaching of transforming the location on the graphical location to values indicating the three-dimensional location in the three-dimensional space into that of Miura computer controller oscilloscope. By doing so, the system would be enhanced by allowing system itself for transforming from local coordinate system based on user indication to graphical representation in three-dimensional space.

As per claim 4, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitation of transforming comprising calculating the values indicating the three-dimensional location via the implicit value associated with the graphical location.

Reinhardt discloses the limitation of transforming comprising calculating the values indicating the three-dimensional location via the implicit value associated with the graphical location as the technique of the corner point is

defined in the three-dimensions and thus requires a three-dimensional value (see col. 14, lines 1-2) and constraint locations, the quantity df/dq is a derivative matrix called the Jacobian (see col. 14, lines 32-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt teaching of transforming comprising calculating the values indicating the three-dimensional location via the implicit value associated with the graphical location into that of Miura computer controller oscilloscope. By doing so, the system would be enhanced by allowing system itself for calculating the Jacobian's constraint matrix values which indicating the graphical location in three-dimensional space.

As per claim 5, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitation of wherein the implicit value is a focus location.

Reinhardt discloses the limitation of wherein the implicit value is a focus location as the technique of the corner point is defined in the three-dimensions and thus requires a three-dimensional value (see col. 14, lines 1-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt teaching of three-dimensional focus value into that of Miura computer controller oscilloscope. By doing so, the system would be enhanced by allowing system itself using Jacobian's three-dimensional focus value for focusing on and indicating the graphical location in three-dimensional space.

As per claim 6, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitation of after positioning the movable item, receiving an indication of a location within the graphical representation where the item appears.

Reinhardt discloses the limitation of after positioning the movable item, receiving an indication of a location within the graphical representation where the item appears as the technique of construct three dimensional models on a video display or other display screen of the computer system with two dimensional input such that the displayed three-dimensional object manipulation emulates physical three-dimensional object manipulation (see col. 4, lines 24-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt teaching of after positioning the movable item, receiving an indication of a location within the graphical representation where the item appears into that of Miura computer controller oscilloscope. By doing so, the system would be enhanced by displaying graphical representation on three-dimensional space to an end user.

As per claim 7, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitation of automatically interpreting a next indication of a location within the graphical representation as a directive for positioning the item at a three-dimensional location corresponding to the location indicated.

Reinhardt discloses the limitation of automatically interpreting a next indication of a location within the graphical representation as a directive for positioning the item at a three-dimensional location corresponding to the location indicated as the technique of camera and primitive parameters are incrementally updated to provide visual feedback of the effect of additional constraints on the three-dimensional model (see abstract) and Update Constraint P0 with Changes (see block 403 in Fig. 4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt teaching of automatically updated or interpreted a next indication of a location within the graphical representation as a directive for positioning the item at a three-dimensional location corresponding to the location indicated into that of Miura computer controller oscilloscope. By doing so, the system would be enhanced by automatically updated a next indication location on the graphical representation on three-dimensional space when constraint value changed. Thus, the system would provide precise location of graphical representation on the three-dimensional space.

As per claim 57, due to the similarity of this claim to the combination of claims 1 and 3, this claims is therefore rejected for the same reasons applied to claims 1 and 3.

As per claim 58, the limitation of wherein the graphical representation of the specimen is a representation of an image captured from a microscope is

taught by Muira as the technique of the display means displays of the picked up image (see col. 21, line 5) when a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53). This claim is therefore rejected for the reason as set forth above.

As per claim 20, due to the similarity of this claim to the combination of claims 3 and 5, this claim is therefore rejected for the same reason applied to claims 3 and 5.

As per claim 21, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitations of defining a plurality of mathematical space and determining a point corresponding to the three-dimensional location within the three-dimensional space by transforming a point from the first of the plurality of mathematical spaces to an equivalent point in a second of the plurality of mathematical spaces.

Reinhardt discloses the limitation of defining a plurality of mathematical space and determining a point corresponding to the three-dimensional location within the three-dimensional space by transforming a point from the first of the plurality of mathematical spaces to an equivalent point in a second of the plurality of mathematical spaces as the technique of the three-dimensional geometric primitives may be chosen from a variety of available primitives and the digital representation of the image selected from a plurality of available images (see col. 5, lines 32-35) and the model's parameters automatically match those of the real

world object depicted in the photograph (see col. 4, lines 2-4), and the camera parameters such as focal length, position, and orientation in space such that the projection of a three-dimensional model through the calculated camera parameter matched the projection of the real world object through the Camera onto the photograph surface (see col. 4, lines 7-12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt's teachings of defining a plurality of mathematical space and determining a point corresponding to the three-dimensional location within the three-dimensional space by transforming a point from the first of the plurality of mathematical spaces to an equivalent point in a second of the plurality of mathematical spaces by matched the calculated camera parameter to the projection of the real world object through the Camera onto the photograph surface into that of Muira's invention. By doing so, the system would be enhanced by allowing itself to transform from one object model in this mathematical space to the next equivalent mathematical space.

As per claim 22, due to the similarity of the limitation of transforming a three-dimensional location specified by a location within the graphical representation and the focus information into a non-orthogonal coordinate system for positioning the item at the three-dimensional location within the three-dimensional space of this claim to the second limitation of claim 21 of determining a point corresponding to the three-dimensional location within the three-dimensional space by transforming a point from the first of the plurality of

mathematical spaces to an equivalent point in a second of the plurality of mathematical spaces, this claim is therefore rejected for the same reason applied to claim 21.

As per claim 23, Miura discloses the limitations of determining depth information indicating at what depth the microscope is focused, transforming the location within the graphical representation and the depth information into information in a coordinate system, and sending the information in the coordinate system to the micromanipulator as the technique of a vertical direction (Z-axial direction) (see col. 8, lines 57-58) wherein the Z-Limit setting operation is OFF and the Z-Limit setting operation is ON (see col. 19, lines 55-57); X, Y, Z Movement (S108) and Display Process (S104)(see Fig. 15); and the control unit 26 control the microscope 3 to perform the focus adjustment and the movement driver of the manipulating stage (see col. 14 line 67 to col. 15 line 2). This claim is therefore rejected for the reason as set forth above.

As per claim 24, due to the similarity of this claim to the combination of claim 22 and the second limitation of claim 23, this claim is therefore rejected for the same reasons applied to claims 22 and 23.

As per claim 49, due to the similarity of this claim to the combination of claims 1, 2, 3, 5, and 12; this claim is therefore rejected for the same reasons applied to claims 1, 2, 3, 5, and 12.

9. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants submitted prior art issued to Miura et al. (USPN: 5,886,684) hereinafter Miura as applied to claims above in view of Applicants submitted prior art issued to Axioskop 2.

As per claims 14-16, Miura discloses the invention substantially as claimed above. Miura, however, does not disclose the limitation of wherein the graphical representation of the three-dimensional space represents a portion being viewed under the microscope at an objective magnification between 5x and 63x (see claim 14) and between 40x and 63x (see claim 15), and greater than or equal to 40x (see claim 16).

Axioskop 2 discloses the limitation of wherein the graphical representation of the three-dimensional space represents a portion being viewed under the microscope at an objective magnification between 5x and 63x, and between 40x and 63x as the technique of the universial achchromatic-alphanatic turret condenser suits objectives from 1.25x to 100x (see page 1, lines 8-9).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Axioskop 2's magnification level between 1.25x to 100x into that of Miura computer controller oscilloscope. By doing so; the system would be enhanced by providing the maximum detail level to a microscope's professional user.

10. Claims 51-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants submitted prior art issued to Miura et al. (USPN: 5,886,684) hereinafter Miura as applied to claims above in view of Applicants submitted prior art issued to Daniel. W. VanArsdale.

As per claim 51, Miura discloses the invention substantially as claimed above. Miura discloses a computer implemented system for positioning an item at a three dimensional location within a specimen comprising a graphical presentation and a manipulation device operable to receive the three-dimensional information indicating the three-dimensional location within the specimen to position the item at the three-dimensional location indicated by the three-dimensional as the technique of the microscope 3 has a manipulating stage 46 in the center and a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58) , the manipulating panel 48 includes joysticks 10 and 11 for manipulating the two micromanipulators 4 and 5 in the X, Y, and Z axial directions (see col. 9, lines 4-6), and a monitors 27 for displaying an image picked up by the TV camera (see col. 9, lines14-15). Miura, however, does not disclose the limitation of a graphical presentation is operable to receive an indication of a location in a two-dimensional representation of the specimen and

a converter operable to convert the location on the two-dimensional representation of the specimen into three-dimensional information location.

Daniel. W. VanArsdale discloses the limitation of a graphical presentation is operable to receive an indication of a location in a two-dimensional representation of the specimen and a converter operable to convert the location on the two-dimensional representation of the specimen into three-dimensional information location as the technique of if a formula requires a hyperplane matrix, Procedure B can be used to convert a point matrix representation of a flat to a hyperplane representation (see page 7, lines 10-11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Daniel. W. VanArsdale's convert a point matrix representation of a flat to a hyperplane representation into that of Miura's three-dimensional microscope invention. By doing so, the system would be enhanced by allowing itself to receive an object's location in two-dimensional and to convert that object into three-dimensional space prior to display to system's user.

As per claim 52, the limitation of wherein the item is an electrode is taught by Miura as the technique of the technique of the manipulating unit 8 is outputs a voltage signal (see col. 21, lines 55-56 and also see Fig. 20). This claim is therefore rejected for the reason as set forth above.

As per claim 53, the limitation of wherein manipulation device is a micromanipulator is taught by Miura as the technique of the display means displays both of the picked up image and the height position of the tip portion of the fine instrument. As the result, the position relation about the tip portions of the micromanipulators can be three dimensionally grasped based upon the plain image produced by the image pick up operation (see col. 21, lines 5-11). This claim is therefore rejected for the reason as set forth above.

As per claim 54, the limitation of one or more additional manipulation devices operable to receive the three-dimensional information indicating the three-dimensional location within the specimen to direct one or more additional items to the three-dimensional location indicated by the three-dimensional information is taught by Miura as the technique of although the character information indicative of the Z-direction position is combined with the image of the TV camera 14 to obtain the superimposing representation, another display device on which the Z-direction position may be displayed (see col. 20, lines 61-65). This claim is therefore rejected for the reason as set forth above.

As per claim 55, the limitation of wherein the two-dimensional representation of the specimen comprises an image depicted a field of view of a microscope is taught by Miura as the technique of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be

moved by a drive mechanism in a horizontal direction (X and Y directions)(see col. 8, lines 55-57 This claim is therefore rejected for the reason as set forth above.

As per claim 56, the limitation of wherein the microscope is movable about a fixed stage is taught by Miura as the technique of the micromanipulator system includes a base 1, a microscope 3 mounted on the base 1, a pair of micromanipulators 4 and 5 arranged on both sides of the microscope 3...the microscope a has a manipulating stage 46 in the center (see col. 8, lines 44-51) and the manipulating stage 46 can be moved by a drive mechanism in a horizontal (X and Y axial directions) and a vertical direction (Z axial direction) (see col. 8, lines 55-58). This claim is therefore rejected for the reason as set forth above.

Allowable Subject Matter

11. Claims 38, 39, 43, 45, and 47 are objected as being dependent upon a rejected based claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 48 is further limit of objected claim 47.

12. The following is an Examiner's statement of reasons for allowance:

Examiner carefully considered claims 38, 39, 43, 45, and 47 of the present application. None of the prior arts of record including Miura et al (USPN:

5,886,684), Reinhardt et al. (USPN: 6,333,749), Simon et al. (USPN: 6,470,207), Hilton et al. (USPN: 5,452,416), Shahidi (USPN: 6,591,130), Shahidi (USPN: 6,529,758), Schulz (USPN: 5,622,170), Venolia (USPN: 5,463,722) discloses nor suggests a computer-implemented method for positioning a movable item within a three-dimensional space observable under a microscope further comprising collecting calibration information comprises: receiving a declination angle theta indicative of how far a drive axis for manipulating the item is declined from horizontal (see claim 38), nor a computer-implemented method for positioning a movable item within a three-dimensional space observable under a microscope further comprising collecting calibration information comprises: receiving a rotation angle phi indicative of how far a drive axis for manipulating the movable item is rotated about the Z axis (see claim 39), nor a computer-implemented method for positioning a movable item within a three-dimensional space observable under a microscope further comprising collecting calibration information comprises: for a plurality of points, performing the following: directing the item to a point, and receiving an indication of where on the image the item appears (see claim 43), nor a computer-implemented method for positioning a movable item within a three-dimensional space observable under a microscope further comprising collecting calibration information automatically directing comprises jogging the relative to the point and returning to the point under control of software (see claim 45), nor a computer-implemented method for positioning a movable item within a three-dimensional space observable under a microscope further comprising collecting calibration information comprises: for a plurality of

points observed at different focus positions of a microscope, performing the following: directing the item to the point, focusing the microscope so the item appears in focus, receiving an indication of where on the image the item appears, and collecting the focus position of the microscope (see claim 47).

Any comments considered necessary by applicants must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

13. Applicant's amendment and remark filed on July/02/2004 have been fully considered, but they are not persuasive.

On page 13, responsive to Interview Summary, during the telephone interviews conducted on June 7, 2004 and June 18, 2004, Examiner indicated that the proposed amendment on independent claim 1 with respect to Miura reference of "receiving **within the graphical representation**" overcame the prior art. However, after further examination and review of Miura reference, Examiner found out that the citation of "receiving, within the graphical representation" is suggests by Miura as the technique of the microscope 3 has a manipulating stage 46 in the center and **a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46** (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58) , **the manipulating panel 48 includes**

joysticks 10 and 11 for manipulating the two micromanipulators 4 and 5 in the X, Y, and Z axial directions (se col. 9, lines 4-6), and a monitors 27 for displaying an image picked up by the TV camera (see col. 9, lines14-15). Accordingly, by moving the two micromanipulators 4 and 5 in three dimensional X, Y, and Z axis within the fine sample of living cell, the monitor 27 can displayed living cell image graphical representation picked up by the TV camera.

On page 14, third paragraph, Applicants ague that "Miura's description of a reference point along the Z direction fails to anticipate "receiving, within the graphical representation, a user indication of a location within the graphical representation" as recited in claim 1". The Examiner, however, does not agree to this argument since Miura discloses the feature of receiving, within the graphical representation, a user indication of a location within the graphical representation as the technique of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein when the Z limit setting key was turned ON by manipulating the joy sticks and the like at the step S112, the present position of the K-th micromanipulator along the Z axis direction at this time is set as the reference point and the stored into the memory (see col. 19, lines 22-26).

Again on the last paragraph of page 14, Applicants argue that " Miura does not describes that the Z-position is set or displayed by " receiving, within the graphical representation, a user indication of a location"". The Examiner,

however, does not agree to this argument since Miura discloses this feature as the technique of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein when the Z limit setting key was turned ON by manipulating the joy sticks and the like at the step S112, the present position of the K-th micromanipulator along the Z axis direction at this time is set as the reference point and the stored into the memory (see col. 19, lines 22-26). Thus, Miura's system allowing its end user to activate Z limit of Z direction axis and setting it ON or OFF based on user desired reference point.

On the first paragraph of page 15, Applicants ague that "because Miura does not teach or suggest the indication of a location as recited, it also does not teach or suggest the recited positioned language, which recites "corresponding to the location within the graphical representation". The Examiner, however, does not agree to this argument since Miura discloses the location within the graphical representation as the technique of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). The micromanipulators are provided independently in three axial directions which are orthogonal to each other for moving the fine instrument three-dimensionally (see col. 5, lines 4-7). Thus, a

fine sample of a cell placed on a Petri dish will provide graphical location when the manipulating stage is moved within the three dimensional axis.

On the second paragraph of page 15, Applicants ague that "Claim 50 recites similar language and so is allowable for at least the reasons presented for claim 1". The Examiner, however, does not agree to this argument. This claim is therefore rejected for at least the same reasons applied to claim 1 as set forth above.

On the paragraph of page 15 and third paragraph of page 16, Applicants argue that "Reinhart does not describes "positioning the moveable at a three-dimensional location....corresponding to the location within the graphical representation "as recited in claim 1" and " For at least these reasons, dependent claims 3-7 and 20-24 are allowable over Miura in light of Reinhart". The Examiner, however, does not agree to this argument since Miura discloses the feature of "positioning the moveable at a three-dimensional location....corresponding to the location within the graphical representation" as the technique of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). The micromanipulators are provided independently in three axial directions which are orthogonal to each other for moving the fine instrument three-dimensionally (see col. 5, lines 4-7). Thus, a fine sample of a cell placed on

a Petri dish will provide graphical location when the manipulating stage is moved within the three dimensional axis. These claims 3-7 and 20-24 are therefore rejected for at least the same reasons as set forth above.

On the fourth paragraph of page 16, with respect to claim 49, Applicants argue that " claim 49 is an independent claim and recites "receiving , within the graphical image, an indication of a location on the graphical image" and "the item is positioned at a location within the specimen at a location corresponding to the location indicated on the graphical image". Therefore, claim 19 is allowable over Miura-Reinhart combination". The Examiner, however, does not agree to this argument since Miura discloses these features as the techniques of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein when the Z limit setting key was turned ON by manipulating the joy sticks and the like at the step S112, the present position of the K-th micromanipulator along the Z axis direction at this time is set as the reference point and the stored into the memory (see col. 19, lines 22-26). **Thus, Miura's system allowing its end user to activate Z limit of Z direction axis and setting it ON or OFF based on user desired reference point** and the display means displays both of the picked up image and the height position of the tip portion of the fine instrument. As the result, the position relation about the tip portions of the micromanipulators can be three dimensionally grasped based upon the plain image produced by the image pick up operation (see col. 21, lines 5-11). Thus, **the relative position of the tip portion of the**

fine instrument within a fine sample such as a cell is place-able on the manipulating stage 46 corresponding to the location indicated on the graphical image could picked up and produced by the image pick up operation of the TV camera 14 (see col. 20, lines 62-63 and see Fig. 2).

On the fifth paragraph of page 16, Applicants argue that " Claim 57 is an independent claim and recites "wherein the means for presenting a graphical representation of the specimen is operable to accept a user indication of a location within the graphical representation of the specimen" and " operable to send three-dimensional location to the means for directing the item to direct the item thereto" and is therefore also allowable over a Miura-Reinhart combination, along with its dependent claim 58". The Examiner, however, does not agree to this argument since these feature are taught by Miura-Reinhart combination as the techniques of a Petri dish 13 for accommodating a fine sample such as a cell is place-able on the manipulating stage 46 (see col. 8, lines 50-53) wherein the manipulating stage 46 can be moved by a drive mechanism not shown in a horizontal direction (X and Y directions) and a vertical direction (Z direction) (see col. 8, lines 55-58). And the Z limit setting key was turned ON by manipulating the joy sticks and the like at the step S112, the present position of the K-th micromanipulator along the Z axis direction at this time is set as the reference point and the stored into the memory (see col. 19, lines 22-26). Thus, Miura's system allowing its end user to activate Z limit of Z direction axis and setting it ON or OFF based on user desired reference point. Manipulating primitives, which

are used to construct three-dimensional models on a video display (see col. 4, lines 24-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include Reinhardt teaching of manipulating primitives, **which are used to receive and construct three-dimensional models on a video display** into that of Miura computer controller oscilloscope. By doing so, the system would be enhanced by allowing system itself for transforming from local coordinate system based on user indication to graphical representation in three-dimensional space.

Claim 57 is therefore rejected for at least of the reasons as set forth above.

Claim 58 is therefore rejected for at least the same reasons applied to claim 57.

On the last paragraph of page 16, with respect to claims 14-16, Applicants argue that "Axioskop does not supplement the shortcomings of Miura. Axioskop discloses a microscope with motorized focusing features. At the very least, Axioskop does not teach or suggest positioning a moveable item at a three-dimensional location in the three-dimensional space corresponding to the location within the graphical representation as recited by claim 1". The Examiner, however, does not agree to this argument. These claims are therefore rejected for at least the same reasons applied to claim 1 as set forth above.

On the last two paragraphs of page 17, with respect to claim 51-56, Applicants argue that "VanArdale does describe "convert a point matrix".

However, Applicants can not find where VanArdale teaches or suggests a "graphical representation is operable to receive an indication of a location on the two-dimensional representation of the specimen" or " positioning an item indicated by three-dimensional information from which the location has been converted"". The Examiner, however, does not agree to this argument since as indicated by The Examiner that when a formula requires a hyperplane matrix, Procedure B can be used to convert a point matrix representation of a flat to a hyperplane representation (see page 7, lines 10-11). By meaning of a point matrix of a flat, system can pick up the indication of a location of an object on the two dimensional array and to convert into hyperplane representation of three-dimensional.

On the last paragraph of page 17, Applicants argue that "dependent claims 52-56 are believed to be allowable over Miura and VanArdale based on the allowability of their based claims and for the feature set forth therein". The Examiner, however, does not agree to this argument, these claims 52-56 are therefore rejected for the same reasons applied to their base claim 51 as set forth above.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG T THAI whose telephone number is (571) 272-4056. The examiner can normally be reached on 8:00 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Cabeca can be reached on (571) 272-4048. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

JOHN CABECA
SUPERVISORY PATENT EXAMINER
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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CUONG T THAI
Examiner
Art Unit 2173

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January 19, 2005